

WHAT IS CLAIMED IS

1. A method for sensing isolation faults in a system including a direct-voltage power supply, which direct-voltage power supply nominally floats relative to a reference conductor, and in which the system also includes a load, a first terminal of which load is connected to a first terminal of said direct voltage power supply, said method comprising the steps of:

coupling to a node, by a resistive coupling path having an equivalent resistance, a fixed proportion of the direct voltage of said direct-voltage power supply, said node being connected by a measuring path to said reference conductor;

measuring a first current flowing in said measuring path at a first time;

measuring a first voltage applied to said load at said first time;

measuring a second current flowing in said measuring path at a second time different from said first time;

measuring a second voltage applied to said load at said second time;

at a time between said first and second times, coupling a second terminal of said direct-voltage power supply to a second terminal of said load, for energization thereof; and

determining, from said equivalent resistance, and said first and second voltages and currents, at least one

of fault voltage and resistance.

2. A method according to claim 1, wherein said step of determining said fault resistance R_{fault} is performed by

$$R_{\text{fault}} = \frac{V_{\text{link2}} - V_{\text{link1}}}{2(I_{\text{gf1}} - I_{\text{gf2}})} - \frac{R_{\text{g}}}{2} \quad (1)$$

where:

V_{link1} is the voltage at load at said first time;

V_{link2} is the voltage at said load at said second time;

I_{gf1} is the current in said measurement path at said first time;

I_{gf2} is the current in said measurement path at said second time; and

R_{g} is said equivalent resistance.

3. A method according to claim 1, wherein said step of determining said fault voltage V_{fault} is established by

$$V_{\text{fault}} = \frac{V_{\text{link2}} I_{\text{gf1}} - V_{\text{link1}} I_{\text{gf2}}}{2(I_{\text{gf1}} - I_{\text{gf2}})} \quad (2)$$

where:

V_{link1} is the voltage at said load at said first time;

V_{link2} is the voltage at said load at said second time;

I_{gf1} is the current in said measurement path at said first time;

I_{gf2} is the current in said measurement path at said second time; and

R_g is said equivalent resistance.

4. A method according to claim 1, wherein said steps of measuring a first voltage at said load, and measuring a second voltage at said load, are performed by measuring voltage across said load.

5. A method according to claim 3, wherein the voltage V_{fault} is referenced to the negative terminal of the load.